

Amend the identified paragraphs in the specification as follows:

**[00063]** Once the printing layout is planned, the size of any space 39 to be left blank is determined. Thereafter, one of several events ~~[[that]]~~ can occur for utilization of this otherwise blank or wasted space 39 (Figure 5). If the size of this otherwise waste space permits, it can be used for the printing of a diagnostic or test pattern to monitor various aspects of the photofinishing printer 12. For example, test pattern among other things can check the health and alignment of the print heads of the printer or color quality.

**[00073]** The longitudinal fiducial mark 50 formed by the nozzle exercise ~~[[are]]~~ is of a known width and a known distance from each longitudinal edge 52 of the paper and the printing of the images 48 commences immediately after the longitudinal fiducial mark 52. The longitudinal fiducial marks also can be made by selective exercise of nozzles in the print head. For example, to make the mark more distinctive to a sensor, such as an optical sensor, as will be discussed below in more detail.

**[00077]** Other layouts are possible depending upon the arrangement created by the computer 14. For example, prints of various sizes can be grouped together so long as there is one dimension (either length or width) in common. This is shown in Figure 5 wherein a plurality of photographs are arranged in three segments wherein the three segments are all on the same printed sheet. There is the first segment 56A containing only two prints, each over printed and with no space between. The second segment 56B contains ~~four smaller~~ three prints (also over printed and with no space between) and the third segment 56C contains one panoramic print. Each of the segments 56A, B and C comprise a printed field bounded on three sides by the transverse and longitudinal fiducial marks 44, 50 respectively. ~~In this case however, the segments are short in that each comprises a single row of prints separated by white space 61.~~ Preferably, the segments, which may be of various widths, are left side justified.

**[00078]** In some cases, processing shorter segments is advantageous, such as the end of a customer order. In such cases each of the short segments such segments 56A, B and C is separated by white space **[[61]] 59** and there is a transverse fiducial mark 44 immediately in advance of each segment. These segments are cut and separated from the larger sheet wherein each contains transverse and longitudinal fiducial marks to provide registration information.

**[0083]** In the case of the arrangement shown in Figure 5, each of the segments 56A, B, C first is separated from the remaining segments with a rough cut through the white space **[[61]] 59**. Each of the separate segments in turn is delivered to a cutter where the first and second cuts 63, 65 (Figure 6B) are made. Each of the segments then is moved laterally to a position for making the separate lateral cuts 68, 70 and 72 as necessary to sever the separate prints.

**[0084]** As noted above, the present invention is able to correct for various printing errors. For example, Figure 7 illustrates the detection of skew in the transport of a segment 56 to a cutting position. In this respect **[[to]]** a third pair of transversely spaced sensors 76 arranged so as to extend across the path of segment motion (indicated by arrow 78) can measure the angular skew of the fiducial mark 44. The transport mechanism (not shown) can then make an appropriate adjustment to compensate for the skew so that the segment is properly aligned with the cutter. A similar arrangement can correct for skew during the lateral transport of a subsegment to a cutter for severing individual prints from the subsegment.

**[0085]** A further application of the present invention can be understood by reference to Figure **[[7]] 8**. Figure **[[7]] 8** shows an arrangement of two spaced-apart transverse fiducial marks 44, one mark being associated with each segment. With the distance between the adjacent fiducial marks 44 being known, a single fourth sensor indicated at 80 can be used to measure the distance between the fiducial marks as the larger sheet is moved in the direction of arrow 82.

**[0104]** Fig. 16 shows the laminate cartridge 182 without the spools 184, 186. The laminate cartridge 182 has a first holder 194 and a second holder 196. The laminate cartridge 182 also has one or more handles 198 attached to the one or more of a first holder 194 and second holder **[[54]]** 196. Figure 16 shows these handles 198 attached to the first spool holder 194 and the second spool holder 196. The first and second holders 194, 196 can be constructed of a durable but light plastic.

**[0105]** There are many designs used to accommodate the first and second holders 194, 196, as well as the handles 198. An ergonomically efficient cartridge design is necessary as will be discussed in more detail below. The laminate cartridge **[[152]]** 182 has one or more guide bars. Figure 16 shows a first guide bar 195 and a second guide bar 197 for holding tension on the laminate substrate 128.

**[0107]** Figure 18 shows ratchet teeth **[[190]]** 192b configured such that the teeth **[[190]]** 192b do extend beyond the core **[[190]]** 190b circumference when seated in the associated repository **[[193]]** 193b. Finally Figure 19 shows **[[a]]** ratchet teeth **[[192]]** 192c that may or may not extend beyond the circumference of the core **[[190]]** 190c when seated in the associated repository **[[193]]** 193c but have a square shape. It is apparent to those skilled in the art that various shaped teeth 192 could be used in this invention and these shapes are shown to illustrate particular possibilities but not to limit the possible tooth shape associated with the invention.

**[0108]** The laminate cartridge 182 in Figure 20 has been ergonomically designed so that the spacing of the handles **[[68]]** 198 (Figure 16 is such to make easy movement from the source of the cartridge to its placement in the holder for the overcoat application apparatus **[[152]]**). Preferably, the laminate cartridge has a flexible frame with an ergonomically beneficial design which allows at least the two spool holders to accommodate a spacing between the handles that accommodates a variety of body sizes thus allowing good ergonomic form while

loading the laminate reel and getting it ready for application to a media while keeping the cost low. Low cost is an issue since the cartridge is a consumable item and may be thrown away after the laminate is used up. These laminate reels are large (4 inches in diameter and 13 1/2 inches long for example and heavy, possibly 8.8 pounds each).

**[0109]** The laminate cartridge 182 is taken out of the packaging by the handles **[[194]]** 198 and set into the overcoat application apparatus holder. The guide bars 195 tension the laminate-carrying donor 128, 197 as discussed above. A ratchet system 204 includes the slot 188 with a tooth **[[196]]** 192 and repository 193 combination as discussed above and as shown in Figure 20. The system **[[199]]** 204 keeps the spent laminate from unwinding from the take-up spool.

**[0124]** Figure **[[6]]** 26 shows the segment 24 completely within the laminator as a subsequent and shorter segment 246 is being transported through the buffer and the leading edge 248 of yet another printed portion is entering the buffer.

**[0134]** The operation of the first service loop will be described as beginning with Figure 30, which shows the leading edge 330 of a laminated cut sheet 304 as passing between the drive rollers 318 and entering the first service loop. As noted hereinabove, drive rollers 318 operate at the same speed as the laminator. This insures that the portion of the cut sheet 304 in the grip of drive rollers 318 moves at the same speed as a trailing edge 338 of the cut sheet that may still be in the grip of the laminator. Also shown in Figure 30 for purposes of illustration is a second cut sheet **[[6]]** 306 that follows the first sheet and has its leading edge 340 spaced from the trailing edge 338 of the first sheet by a distance "x".

**[0137]** Since a length of a cut sheet may be longer than the length of the path of travel defined by guide 324, some room must be made for the length of sheet being moved into the first service loop while the deskewing rollers are stopped. Accordingly, the controller acts to rotate the lower portion 328 of the

guide about the axis 334 so a trap in the guide is opened (Figure 33). With the trap open, a length of the sheet driven into the first service loop can bow out into the space created by the opening. In this way the first service loop can accommodate a length of the sheet by causing a service loop 305 to form that is much longer than the length of the path of travel defined by the guide 28. The length of the service loop ( $L_{SL}$ ) between the drive rollers 318 and the nip 321 equals the length of the path of travel with the trap closed ( $L_C$ ) plus the speed ( $V_L$ ) of the driving rollers 318 multiplied by the time that the deskewing rollers are stopped ( $T_1$ ) or  $L_{SL} = L_C + (V_L \times T_1)$ .

**[0139]** As described above, the deskewing rollers draw the cut sheet from the service loop at a speed faster than the speed at which the following sheet 306 is delivered to the first service loop. However, the length of the first sheet may be such that time does not permit the removal of a sufficient length of the first sheet 4 to prevent the following sheet 306 from catching up to the first sheet at some point along the path of travel. In other words the length of the gap 'x' between the sheets could be reduced to a negative number before the first sheet is out of the first service loop. This means that the leading edge 340 of the second or following sheet 6 will run into the trailing edge 338 of the first or leading sheet 304. Keeping the trap open avoids this situation.

**[0146]** In the laminator, a protective laminate is applied to the printed surface of the photographic paper. The laminate is any suitable clear plastic 0.5 to 1.0 mil film that is applied to the printed surface of the paper. The paper and laminate then pass through a nip ~~418 (shown in Fig. 10)~~ as shown in Figure 9 that presses the two together, preferably with heat so the laminate is adhered to the image surface. Since the photograph is on glossy paper and both surfaces of the laminate are smooth, the result is a laminated, glossy finish photograph.

**[0155]** If a matte finish photograph is desired, the computer 16 causes the operation of cam 458. Operation of the cam causes the lever arm 448 to pivot to the right as shown in figure 40, which in turn causes the pressure

roll **[[46]]** 446 to create a nip between it and the heated embossing roller **[[40]]** 440. Now, when a laminated print reaches the embossing roller, the print passes through the nip so the laminate side **[[15]]** is contacted and pressed against the heated embossing roller. The heat of the embossing roller softens the laminate **[[15]]** and this allows the textured surface of the embossing roller to modify the surface of the laminate by embossing the texture of the roller surface **[[42]]** 442 into the laminate. The result of this operation is that light now will reflect off the laminate surface at a different rate giving it the appearance of a matte finish. The photograph passes to the exit 434 and a matte finish photograph is produced from the glossy print.